

ACCOUNTING FOR REGIONAL FACTORS OF THE ALTIMETER SEA STATE BIAS

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ABSTRACT

Investigations of the sea state bias in Topex altimeter measurements of sea surface height show considerable regional variability of the estimated SSB values. As a result, the globally optimized geophysical model functions appear to be inappropriate in some regions of the world ocean: they yield systematic, geographically dependent biases up to 6 cm. Particularly large anomalies in the SSB values are observed in the regions of major ocean current systems, such as the **Aghulas** current, Gulf Stream, Kuroshio, etc. These anomalies appear to be caused by regional conditions affecting surface gravity waves. For example, scattering, refraction and other types of interactions between the surface gravity waves and ambient ocean currents result in distortions of surface wave spectra, hence in variations of the mean height of specular points responsible for SSB. Based on a recently developed **two-dimensional** numerical model of SSB, some anomalies in the SSB values can be explained. In particular, we quantify effects of sea swell generated in a remote ocean regions: its influence on SSB is shown to depend on the swell wavelength, height and direction with respect to the locally-generated wind wave characteristics.

An **approach** to accounting for various factors of SSB is proposed as based on the use of auxiliary information. Such information is available from synthetic aperture radar images and from climatological data.